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On the Vapour-Pressure and Osmotic Pressure of a Volatile Solute

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others it is the enhanced lines which may be expected to show the most important coincidences.

6. The flutings which occur in the arc and arc-flame do not appear when the arc is passed in an atmosphere of hydrogen. As suggested by Thalén, they are probably due to oxide of scandium.

Tables are given which show the lines of the arc spectrum from 3930 to 6580, the positions of the oxide flutings, and comparisons of the principal lines of the two classes with the sun, sun-spots, and chromosphere.

On the Vapour-pressure and Osmotic Pressure of a Volatile Solute.

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It follows by a method given in a recent paper by the author that if the osmotic membrane be assumed to be impermeable to the solute, the formula for the change of vapour-pressure of a volatile solute with hydrostatic pressure, and also the formula for the osmotic pressure which is deduced from it, must be the same as the formula for a non-volatile solute, and should not contain any terms depending on the vapour-pressure of the solute, except in so far as it may affect the hydrostatic pressure of the solution.

If, on the other hand, an osmotic membrane is regarded as a vapour-sieve, permeable to the vapour of the solution but not to the liquid phase, the equation takes a different form, depending on the concentration of the constituents in the vapour-phase. If c_1, c_2, etc., be the concentrations of the constituents in grammes per gramme of the vapour, and if U_1, U_2, etc., be the specific volumes of the constituents in the solution, the change of total vapour-pressure dp of the solution for a change of hydrostatic pressure dP is given by the relation,

$$\Sigma c\mathrm{U}\ d\mathrm{P} = v\ dp,$$

where v is the specific volume of the whole vapour-phase. If only one constituent is volatile, this relation reduces to the form $\mathrm{U}\ d\mathrm{P} = v\ dp$ for that constituent.

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